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PROJECT
"TOWN HALL"
AIR LAUNCHED
PHOTO RECONNAISSANCE
SATELLITE

NRO REVIEW COMPLETED

USAF review(s) completed.

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ORIGINAL PROPOSAL

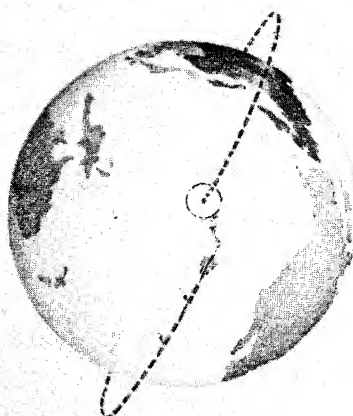
Concept

AIR LAUNCH FOR:

- QUICK REACTION
- LAUNCH AND RECOVERY FLEXIBILITY
- SECURE OPERATIONS
- INCREASED PAYLOAD CAPABILITY
- OMNI-DIRECTIONAL TARGET APPROACH

SINGLE PASS SYSTEM FOR:

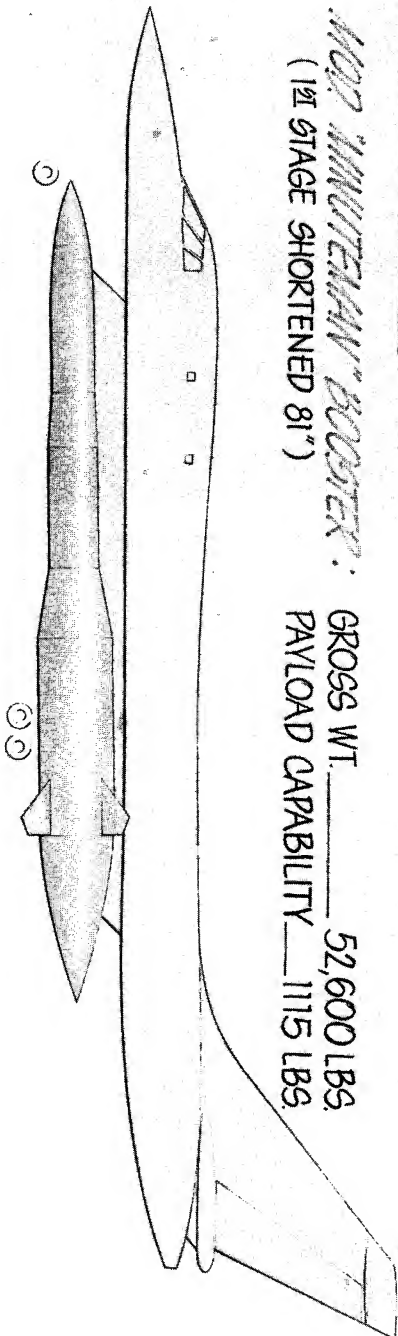
- SIMPLICITY
- INVULNERABILITY



Growth Capability to Multiple Pass Operation

Configuration

NO. 1 "MINUTEMAN" BOOSTER: GROSS WT. 52,600 LBS.
(1ST STAGE SHORTENED 81") PAYLOAD CAPABILITY 1115 LBS.



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SUBSEQUENT STUDIES

MISSILE DESIGN

- INCREASED PAYLOAD BY INCREASED BOOSTER SIZE (MINUTEMAN AND NEW BOOSTERS)
- EVALUATION OF ENVIRONMENTAL EFFECTS ON MOTORS

AIRPLANE STUDIES

- DETERMINE MAX. BOOSTER SIZE COMPATIBLE WITH B-58
- WIND TUNNEL TEST PROGRAM & A/P PERFORMANCE STUDY

PERFORMANCE

- OPTIMUM COMBINATION OF MISSILE/B-58 PERFORMANCE
- COMPARISON OF GROUND AND AIR LAUNCHING

PAYLOAD

- ADVANCED GUIDANCE AND CONTROL CONCEPTS
- MULTIPLE PASS REQUIREMENTS AND CAPABILITIES

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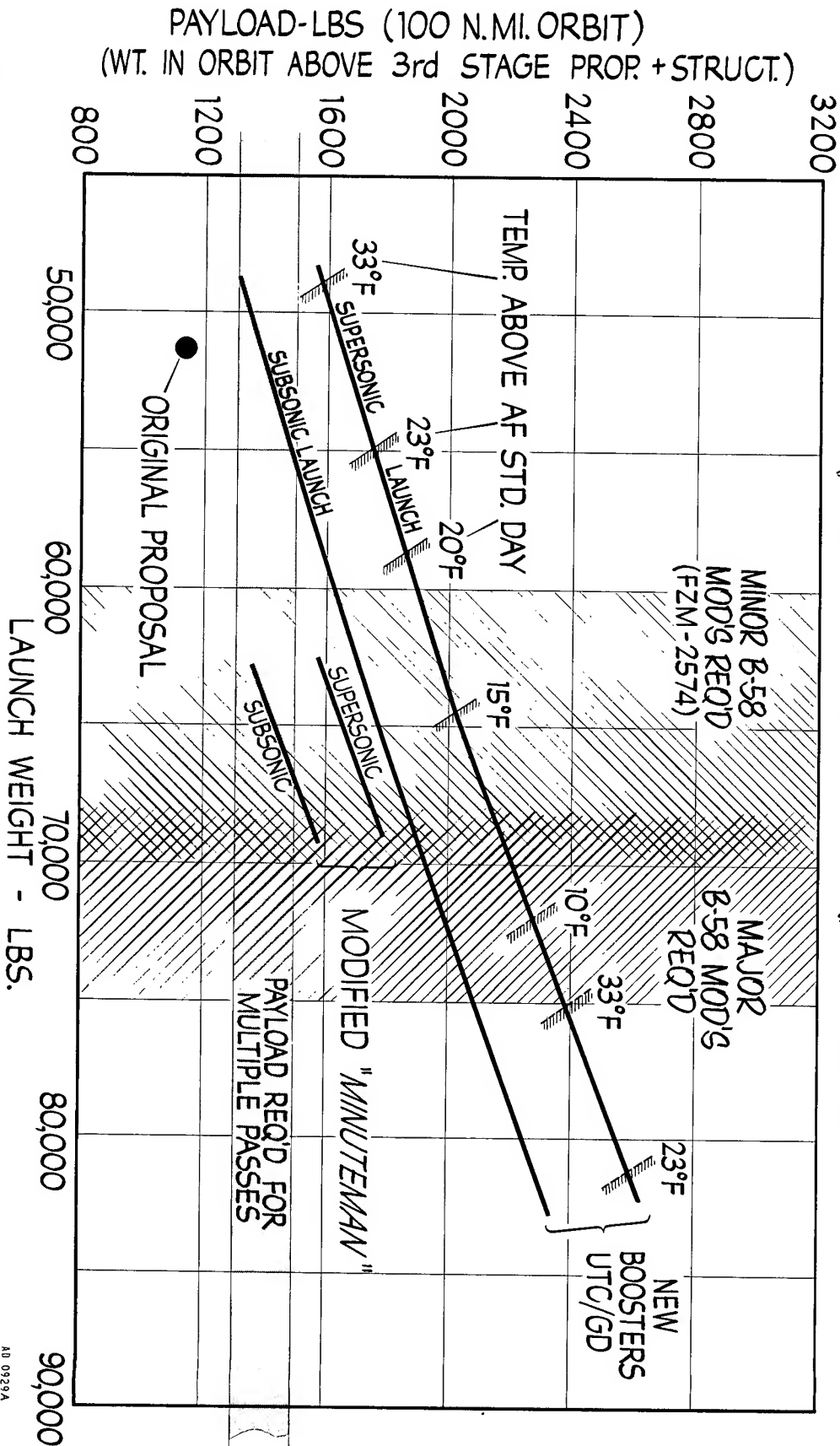
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SUMMARY OF STUDY RESULTS

ACCELERATION LIMITS:

J79-5B ENGINES
(PRESENT B-58)

IMPROVED
J79 ENGINES



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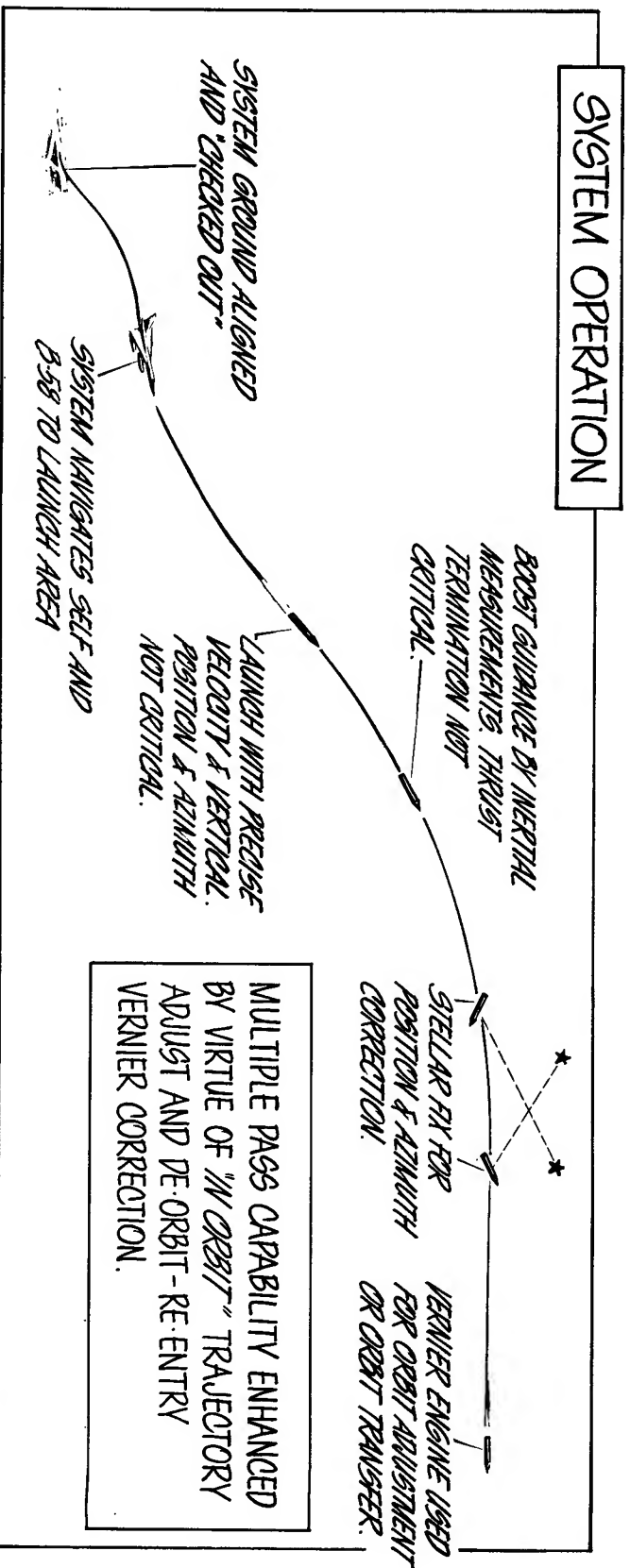
INTEGRATED GUIDANCE & CONTROL SYSTEM

(Based on system under development by United Aircraft)

SYSTEM COMPONENTS

- HIGH QUALITY INERTIAL PLATFORM
- WIDE ANGLE STAR MONITOR
- MEGACYCLE DIGITAL COMPUTER
- HYPERGOLIC VERNIER PROPULSION
- COLD GAS ATTITUDE CONTROL

SYSTEM OPERATION



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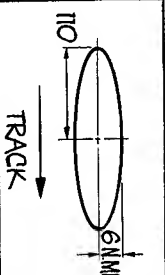
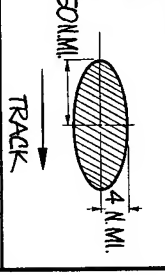
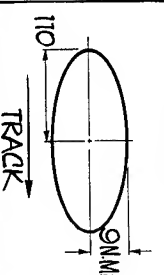
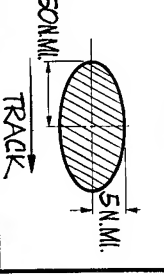
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INTEGRATED VS. CONVENTIONAL SYSTEM COMPARISON

PERFORMANCE FEATURES

MULTIPLE PASS MISSION (8 passes, no tracking)

	CONVENTIONAL PURE INERTIAL SYSTEM	INTEGRATED STELLAR INERTIAL G-CP SYS.
ON-ORBIT POSITION ACCURACY		
DE-ORBIT RECOVERY ACCURACY		

OPERATIONAL FEATURES

FOR INTEGRATED SYSTEM

- Launch w/o accurate Pos. & Az.
- Orbit changes possible during mission
- Thrust-termination not critical
- Vernier recovery guidance possible

AVAILABILITY

- Conventional system — 9 months
- Integrated system — 18 months

RECOMMENDED APPROACH

- Interim conventional system
- Grow into fully integrated system

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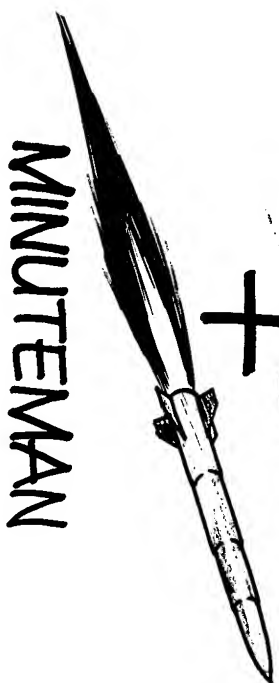
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SYSTEM POTENTIAL

B-58



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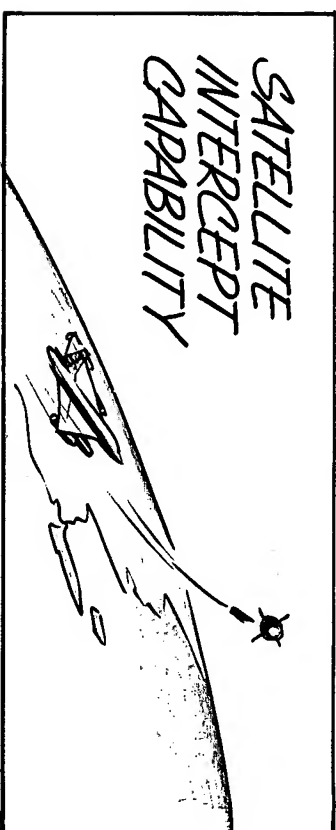


MINUTEMAN

=

MOBILE (INEXPENSIVE)
LAUNCH CAPABILITY

SATELLITE
INTERCEPT
CAPABILITY



COVERT PHOTO
RECONNAISSANCE
CAPABILITY



OTHER APPLICATIONS

- EQUATORIAL SATELLITES
- ADVANCED ICBM POTENTIAL
- MOBILE SPACE PROBES

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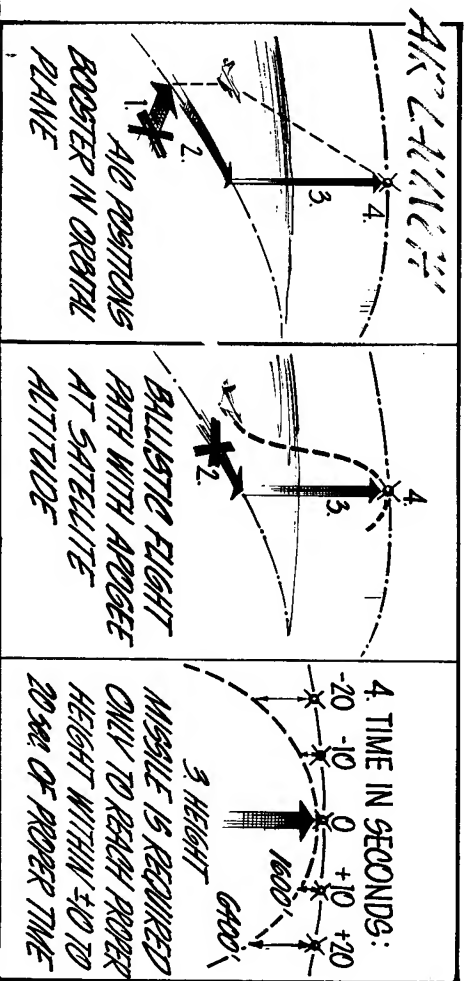
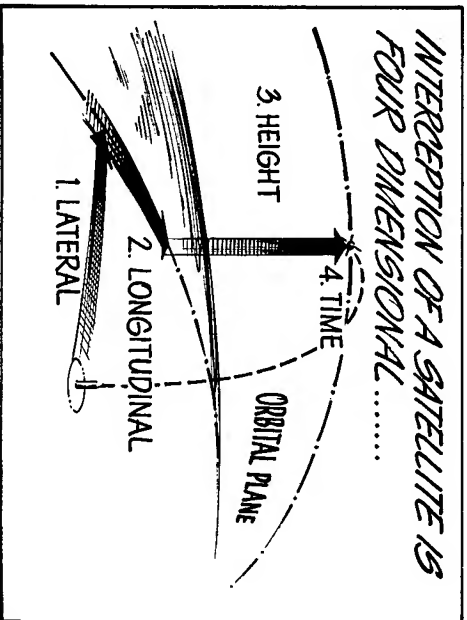
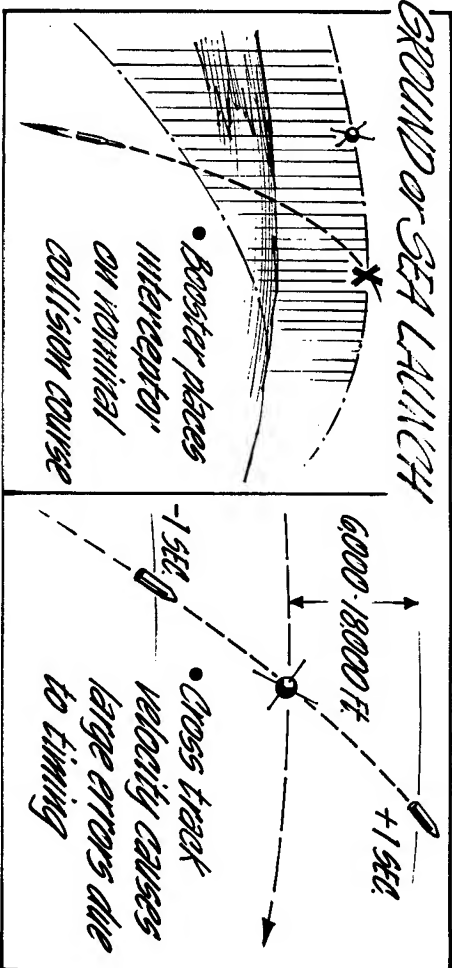
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SATELLITE INTERCEPTOR SYSTEM ADO-40

REQUIREMENTS

- EARLY CAPABILITY
- DIRECT INTERCEPT
- COLD WAR SYSTEM
- COVERT CAPABILITY
- NUCLEAR or NON-NUCLEAR KILL
- EXISTING BOOSTERS
- 800-1000 N.M. CAPABILITY
- COMPATIBLE WITH SPADATS

LAUNCH TECHNIQUES



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COMPARISON OF LAUNCH TECHNIQUES

APPROACH

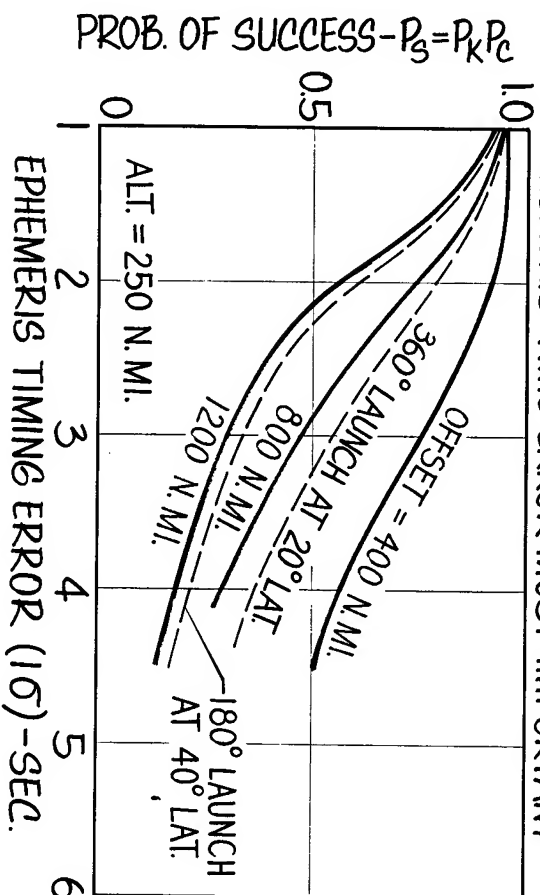
ANALYSIS OF:

- SPADATS CAPABILITY/ACCURACY
 - EFFECT OF TERMINAL GEOMETRY ON MISS DISTANCE
 - ERROR CORRECTION CAPABILITY
 - WARHEAD DEPLOYMENT ERRORS
- TO DETERMINE:
- INTERCEPT GEOMETRY FOR MAXIMUM EFFECTIVENESS
 - INFLUENCE OF ERRORS

RESULTS

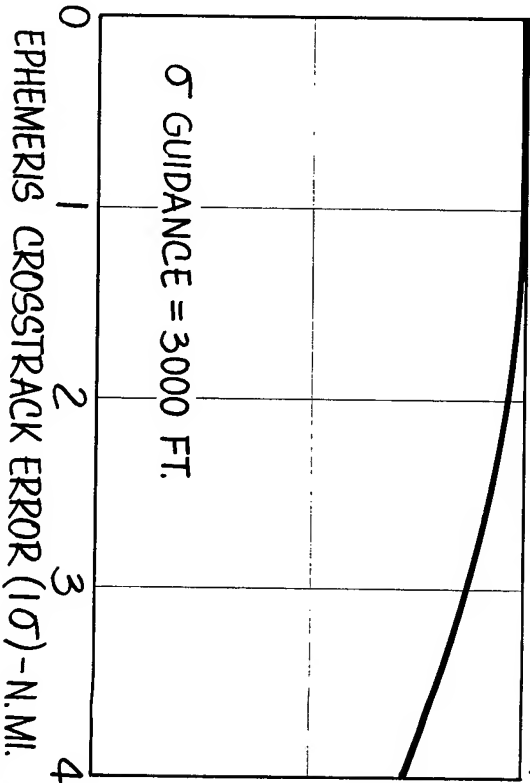
SURFACE LAUNCH

EPHEMERIS TIME ERROR MOST IMPORTANT



AIR LAUNCH

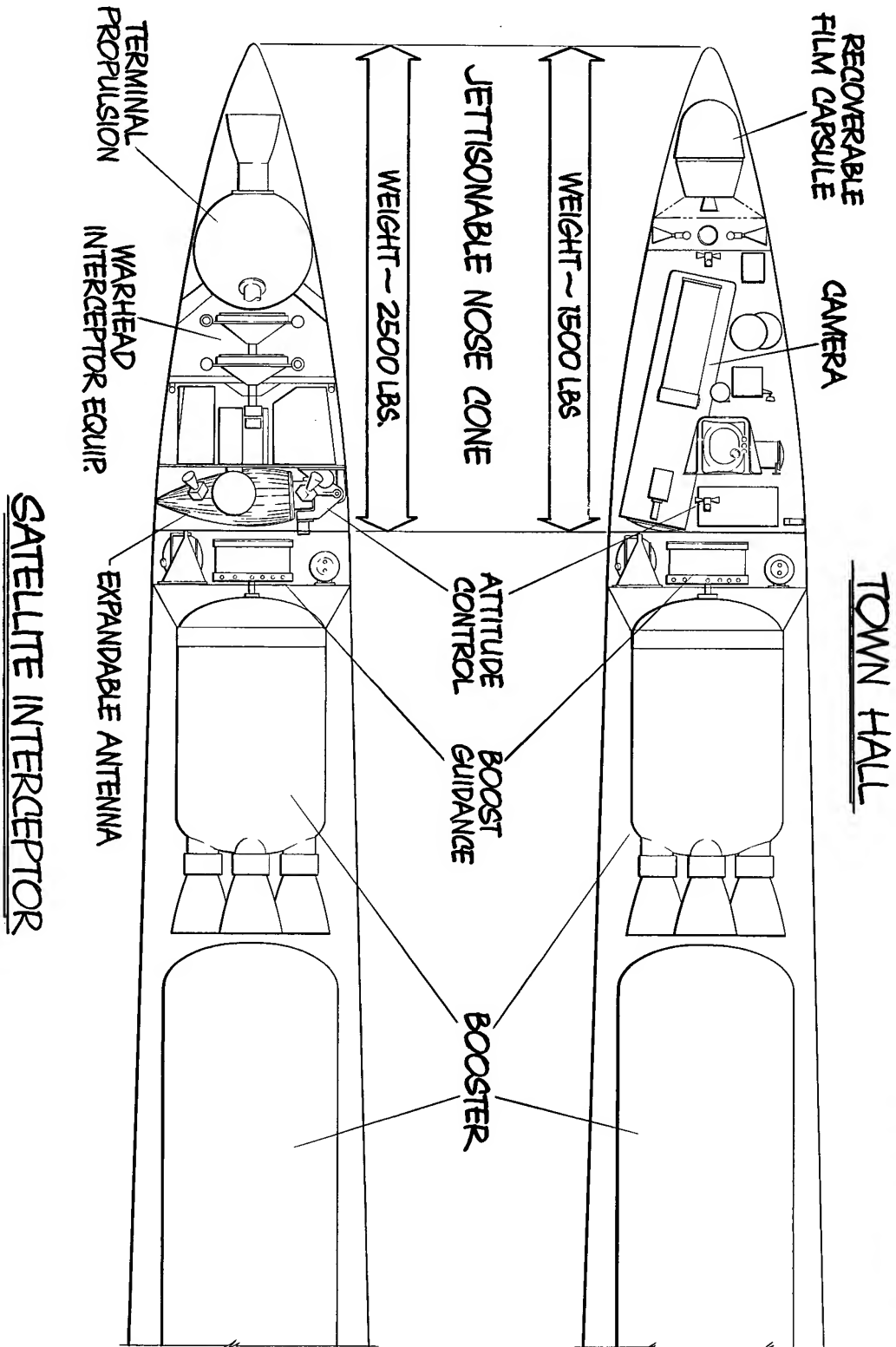
EPHEMERIS CROSSTRACK POSITION MOST IMPORTANT



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COMPARISON OF TOWN HALL & SATELLITE INTERCEPTOR

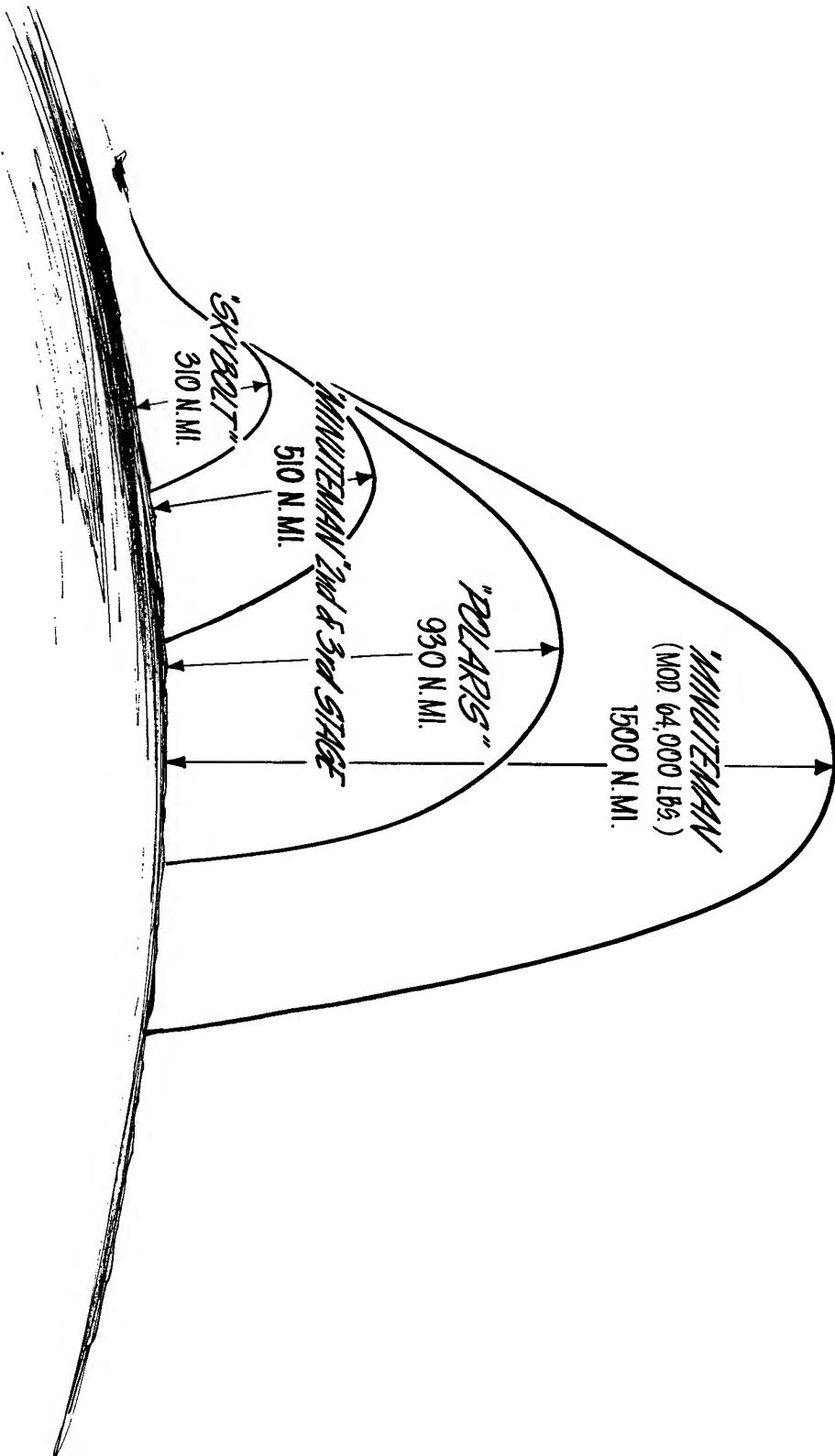


GROUP

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BOOSTER CAPABILITIES



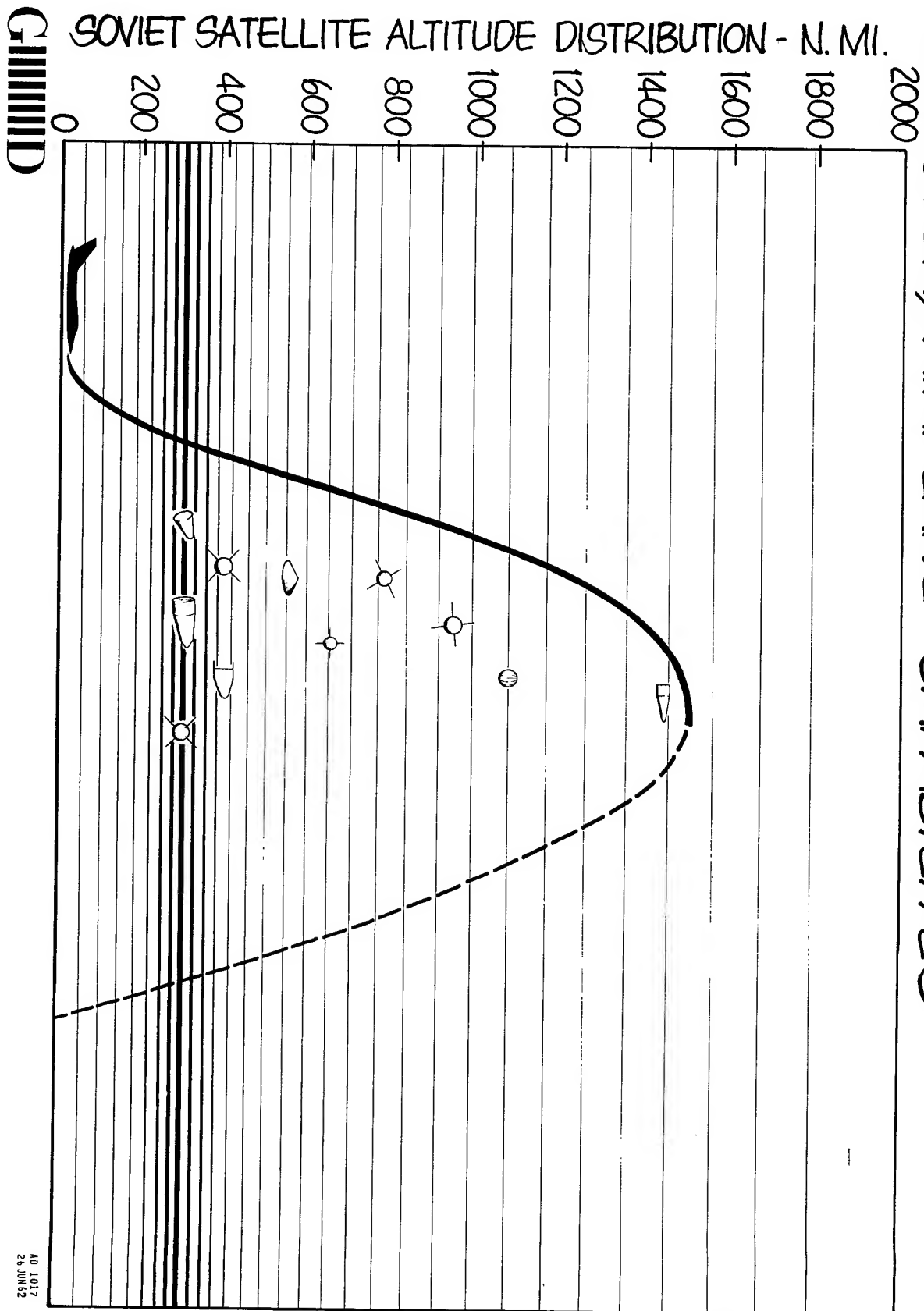
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BOOSTER/AIRPLANE CAPABILITIES



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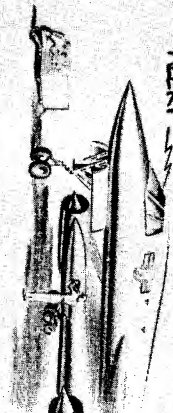
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SYSTEM OPERATION

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PRE-FLIGHT

ALERT



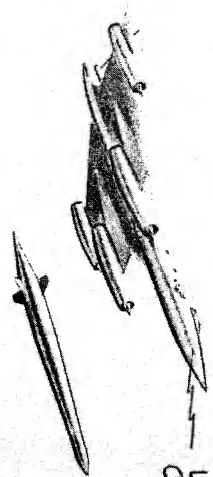
- AIRCRAFT PREPARED FOR FLIGHT
- MISSILE GUIDANCE ALIGNED AND TRIMMED
- INITIAL EPHEMERIS AND TRAJECTORY LOADED
- SYSTEM CHECK-OUT

COMPOSITE FLIGHT



- AIRCRAFT FLOWN TO PRE-COMPUTED COURSE
- MISSILE GUIDANCE NAVIGATES AIRCRAFT
- UPDATED EPHEMERIS ENTERED

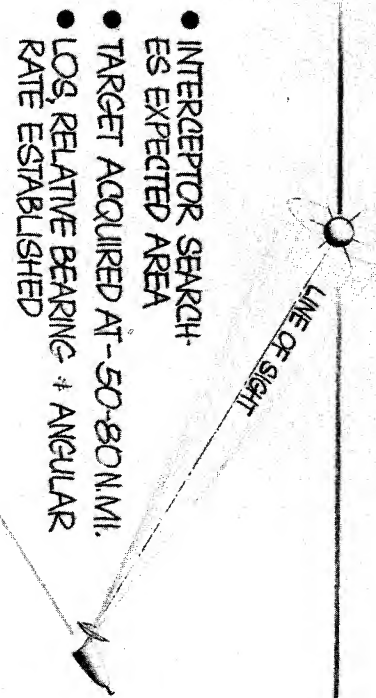
BOOST



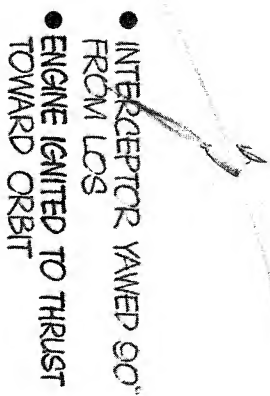
LAUNCH COMMAND

- LAUNCH POINT DETERMINED BY GUIDANCE COMPUTER
- BOOSTER BURNS OUT WITH VELOCITY IN ORBIT PLANE
- INTERCEPTOR SEPARATES FROM BOOSTER

TERMINAL PHASE



- INTERCEPTOR SEARCHES EXPECTED AREA
- TARGET ACQUIRED AT -50-80 N.M.I.
- LOS, RELATIVE BEARING + ANGULAR RATE ESTABLISHED



- INTERCEPTOR YAWED 90° FROM LOS
- ENGINE IGNITED TO THRUST TOWARD ORBIT

- WHEN LOS RATE IS ZERO VEHICLE YAWED TO THRUST ALONG LOS ON COLLISION COURSE
- WARHEAD DEPLOYED ON RANGE-TO-TARGET BASIS

GUIDANCE

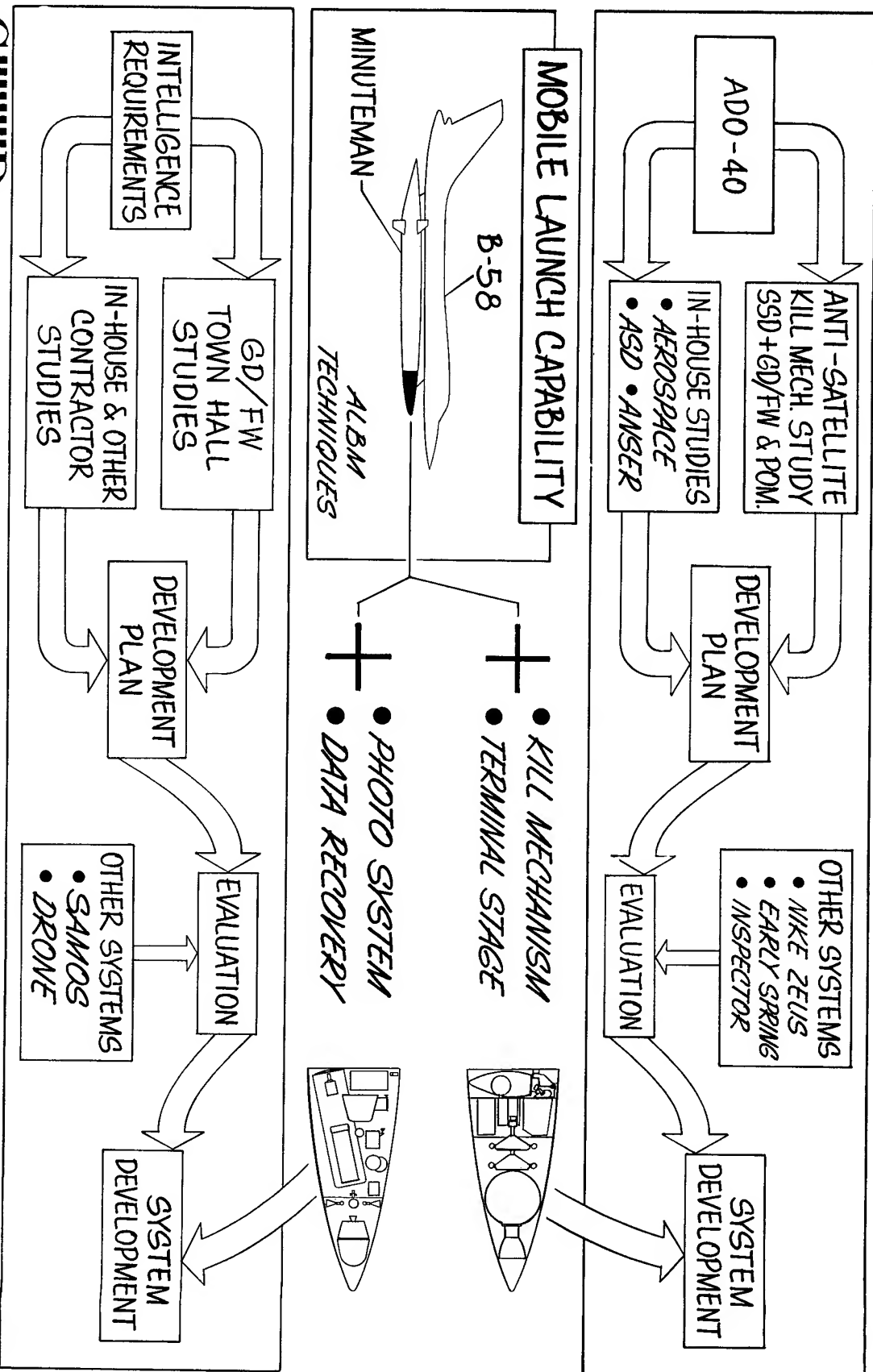
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ADO-40/TOWN HALL RELATIONSHIP



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CONCLUSIONS AND RECOMMENDATIONS

- ADO-40 system and various covert recon. systems are being studied and evaluated by separate contractor and USAF groups.
- This dual separate approach may well result in choice of two systems, optimum for each mission, but entirely different in hardware items.
- The mobile launch concept is competitive for each mission and should be evaluated simultaneously by USAF personnel cognizant of both missions.
- Choice of mobile launch concept could lead to greatly reduced development costs, operational costs and reliability improvements through adoption of a standard boost vehicle for dual purpose use.

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